

3.0 DIOXINS/FURANS

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Progress Toward Challenge Goals

U.S. Challenge: Seek by 2006, a 75 percent reduction in total releases of dioxins and furans (2,3,7,8-TCDD toxicity equivalents) from sources resulting from human activity. This challenge will apply to the aggregate of releases to the air nationwide and of releases to the water within the Great Lakes Basin.

Canadian Challenge: Seek by 2000, a 90 percent reduction in releases of dioxins and furans from sources resulting from human activity in the Great Lakes Basin, consistent with the 1994 COA.

Both countries have made significant progress toward reaching the dioxin/furan reduction goals outlined in the Strategy. Based upon the 1987 baseline inventory, known U.S. dioxin emissions were reduced 77 percent by 1995 and are projected to be reduced 92 percent by the end of 2004. These reductions are primarily the result of implementing the Maximum Achievable Control Technology, or MACT, program under the Clean Air Act. Reductions in the largest inventory categories are shown in Figure 3-1. Once the MACT program has been fully implemented, the largest dioxin source in the U.S. will be household garbage burning.

The U.S. is also investigating numerous dioxin sources that have not yet been added to the inventory. While the U.S. challenge goal for dioxin was met under the Strategy, according to our current inventory, US EPA is concerned about sources not yet quantified. Many of these sources are difficult to inventory, such as forest fires and other uncontrolled combustion sources.

Canada has made significant progress toward meeting the goal of a 90 percent reduction in releases of dioxins and furans, achieving a 79 percent reduction, relative to the 1988 Canadian baseline. Much of the reductions achieved are attributable to the pulp and paper sector after federal regulations were imposed. Figure 3-2 illustrates reductions in the top Canadian (Ontario) dioxin/furan emission sources from 1990, 1997, and 1999 (based on "Inventory of Releases - Updated Edition", February 2001, Environment Canada). The figure also includes a forecast for 2005. The renewed Canada-Ontario Agreement with Respect to the Great Lakes Basin Ecosystem commits to a 90 percent reduction in the release of dioxin/furans by the year 2005, from a baseline of 1988. Based on current initiatives underway or proposed for dioxins/furans, such as Canada-wide Standards for waste incineration, iron sinter and electric arc furnaces, and Ontario's proposal to phase out hospital incinerators, it is expected that Canada will meet this commitment by 2005 within the Great Lakes Basin.

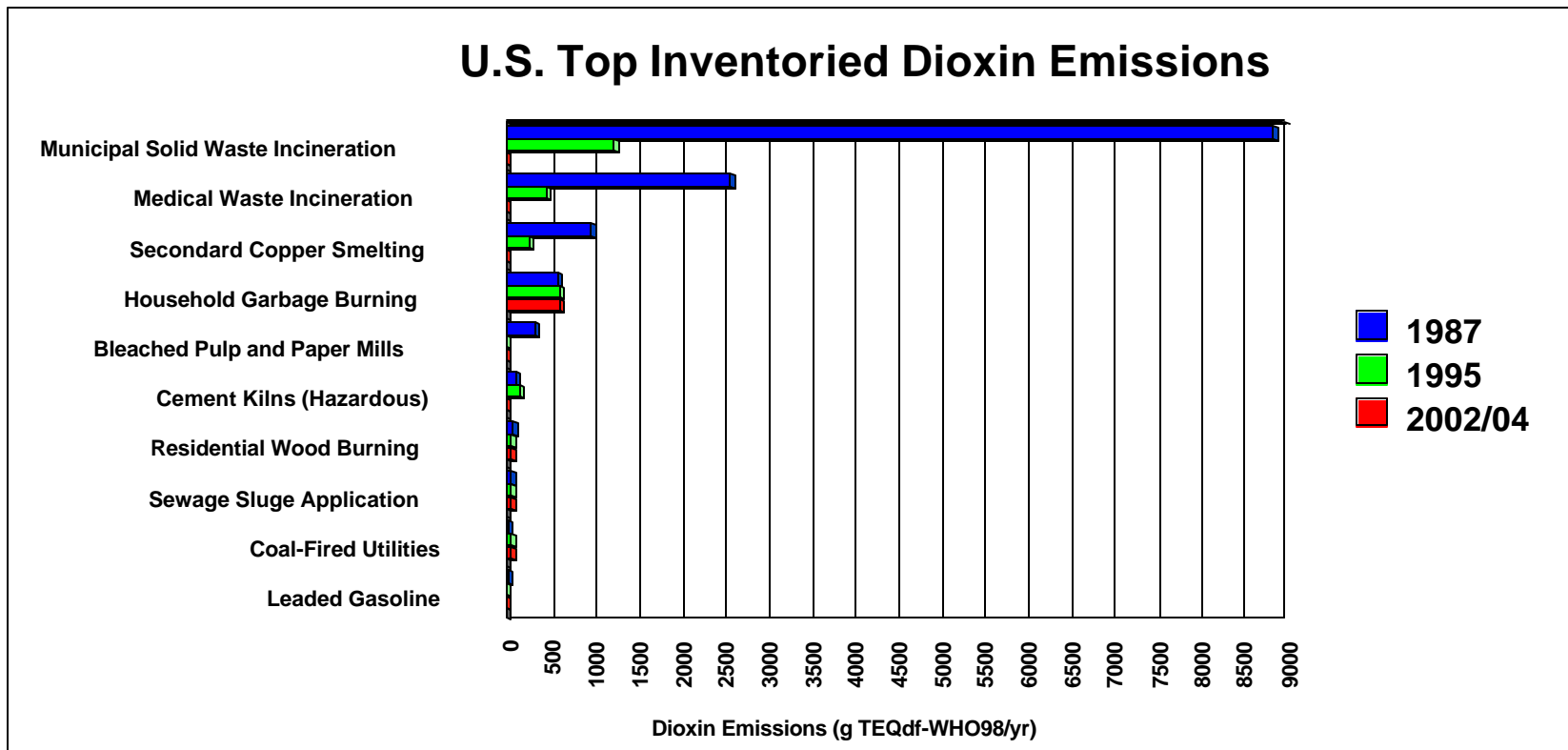


Figure 3-1. U.S. Top Inventoried Dioxin Emissions

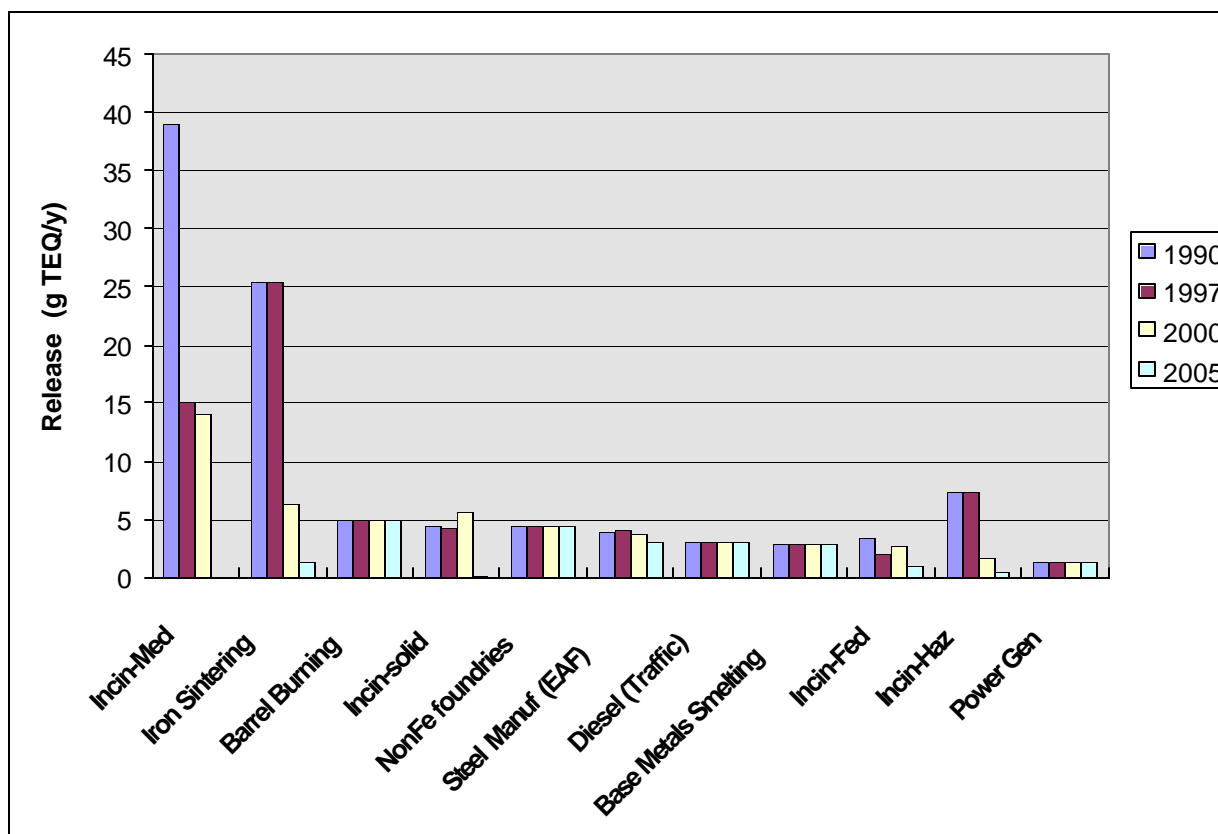


Figure 3-2. Top Canadian (Ontario Region) Dioxin/Furan Emission Sources
"Inventory of Releases - Updated Edition", February 2001, Environment
Canada

Workgroup Activities and the 4-Step Process

In the past year, the Workgroup has made the following progress in the 4-step process:

- The Workgroup held a teleconference call to discuss the ash management issue on April 24, 2002.
- The Workgroup met on May 30, 2002 at the Binational Toxics Strategy Stakeholder Forum in Windsor. The Workgroup meeting was held jointly with the HCB/B(a)P Workgroup due to common issues that are of interest to both Workgroups.
- The Workgroup held teleconference calls to discuss the treated wood issue on July 24, 2002 and November 13, 2002.
- The Burn Barrel Subgroup was formed in the spring of 2000 to address the emerging issue of residential “backyard” garbage burning. Through conference calls, surveys, and research, the Subgroup developed a strategy in May 2001 to seek reductions in backyard trash burning. The strategy is currently being implemented by both national governments along with partners in States, Provinces, Tribes, First Nations, municipalities, industries, and environmental and health organizations.

Reduction Activities

Burn Barrels and Household Garbage Burning

Burn barrels and other household garbage burning methods remain a high reduction priority for the Workgroup. Formation of a Burn Barrel Subgroup was initiated in the spring of 2000 to address the issue of residential garbage burning. This source category is estimated to emerge as the largest source of dioxin emissions after air emissions standards for industrial sources are in place. The Subgroup is currently led by Bruce Gillies of Environment Canada. The practice of household garbage burning is typically carried out in old barrels, open pits, woodstoves, or outdoor boilers. Through surveys and research conducted over the past two years, the Subgroup developed the Household Garbage Burning Strategy in May 2001 for seeking reductions in backyard trash burning.

In 2002, the Subgroup developed education and outreach materials, and contacted decision makers and outreach partners. A workshop on “Burning Household Garbage: Impacts and Alternatives” was held in April 2002 in Thunder Bay, Ontario, in conjunction with the Lake Superior Binational Forum. In May 2002, the Subgroup launched a public website, www.openburning.org, to provide information and educational materials on trash and open burning in the Great Lakes region. A broad public outreach program on both sides of the Canada/U.S. border is taking place in 2002-2003, beginning in the Lake Superior region. The U.S. and Canada are looking to the Household Garbage Burning Strategy in the Great Lakes Basin as a model for other parts of the two countries.

Wood Preservation

The Dioxin Workgroup has been working to address treated wood life-cycle management practices for utility poles. When poles reach their end life for utilities, they are typically resold into a secondary market. The Workgroup is focusing on an outreach effort to this secondary market on the appropriate use and care of treated wood.

Canada and the U.S. have gathered information on the management of out-of-service treated wood. In the U.S., the Utility Solid Waste Management Group (USWAG) leads this activity. In Canada, the wood preservatives issue is being managed as a national issue under the EC-led Strategic Options Process. Both countries are exploring pilot project opportunities to improve public awareness on safe and environmentally responsible handling of used treated in the Great Lakes Basin.

Incinerator Ash Disposal

The significance of dioxins/furans in landfill leachates generated by disposed incinerator ash is uncertain. How well these leachates are contained at existing landfills is also in question. Improved air pollution control at waste incinerators can result in the transfer of toxic substances from air to ash. Recent amendments made to the Ontario Waste Management Regulation (Regulation 558) set more stringent requirements for hazardous waste management, and facilities are required to conduct leachate tests using the Toxicity Characteristic Leaching Procedure

(TCLP). The new regulation is also expected to result in more wastes being characterized as hazardous. In the U.S., ash is not tested for dioxin/furans in most of the Great Lakes states, except Minnesota. In addition, information on testing after implementation of the U.S. incinerator MACT standards is not available. Further information is needed regarding dioxins and furans in both bottom and fly ash generated at waste incinerators.

According to past analyses conducted on leachates (NITEP report, CORRE, mostly using obsolete techniques), the dioxin/furan levels measured were low, at concentrations less than 1 ppb. The available literature does not provide evidence that disposal of municipal waste incinerator ash leads to dioxin leaching. Canada will conduct a study in an attempt to answer these questions.

Landfill Fires

Preliminary estimations conducted by US EPA showed that landfill fires are a potential source of significant dioxin/furan release. A discussion paper has been prepared by the Workgroup co-chairs that presents the current situation and the requirements to prevent landfill fires in the Great Lakes Basin. Preliminary investigation has shown that landfill fires appear to be infrequent, but additional information is required to fully characterize the significance of this source.

In Ontario, landfill fires at municipal landfills are infrequent due, in part, to existing regulations that ban burning of garbage at landfill sites. It is suspected that landfill fires exist on First Nations lands, but more information needs to be collected on their waste management practices. Canada will be conducting a study to gather information on open burning practices on First Nations lands in Ontario. In addition, under the dioxin/furan Canada-wide Standard process, a national study to gather information on trench burning is underway.

Based on information gathered from the majority of Great Lakes states (Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, and Wisconsin), landfill fires seem to be infrequent. Information gathered from the Ohio Fire Marshall's office, however, indicates that landfill fires are common. US EPA is currently gathering more information regarding this issue.

Inventory Improvements

US EPA maintains and annually updates the Toxics Release Inventory (TRI), a publicly available database that contains information on toxic chemical releases and other waste management activities. Due to the high toxicity of dioxin and furans to humans, US EPA added these as chemicals that facilities are required to report for the 2000 inventory, which was released in May of 2002. According to TRI, 99,814 grams of total releases of dioxin and dioxin-like compounds were reported for 2000 in the U.S. More information is available on the website at www.epa.gov/tri.

In addition to the TRI, the eight Great Lakes States and the Province of Ontario maintain a regional emissions inventory for hazardous air pollutants, which includes dioxins and furans. US EPA also continues to update the National Dioxin Emissions Inventory, which indicates that over 90 percent of all dioxin releases in the U.S. are from air sources.

For the reporting year 2000, Environment Canada added dioxins and furans to the National Pollutant Release Inventory (NPRI) list of substances. The NPRI is available to the through the Environment Canada website at www.ec.gc.ca/pdb/npri. Dioxin/furan data are available on the website for reporting years 2000 and 2001. Environment Canada will use the NPRI data to update the point source information in the National Dioxin/Furan Release Inventory.

Since the initiation of the Voluntary Stack Testing Program in the spring of 2000, Environment Canada has conducted stack tests for dioxins and furans and many other substances of concern at five volunteer facilities in Ontario. Stack tests were conducted at Falconbridge Kidd Creek—a nickel base metal smelter, Toronto Hospital for Sick Children—a medical waste incinerator, Westcast Industries—a steel foundry, Norampac—a Kraft boiler, and Upper Canada Cemeteries—a crematorium. Results are available for the first three facilities. Results from two facilities are under review. Results of these tests were presented at the GLBTS stakeholder meetings. Canada also conducts stack tests under other programs. These programs are currently underway in the base metal smelter and electric arc furnace sectors.

Ambient Air Monitoring

US EPA conducts air monitoring for dioxin under the National Dioxin Air Monitoring Network (NDAMN), in order to track fluctuations in atmospheric deposition levels. In addition, US EPA is planning to fund a two-year dioxin monitoring project at IADN (Integrated Atmospheric Deposition Network) sites near Lake Michigan, beginning in 2003.

Ambient air monitoring of GLBTS substances has been conducted in Canada since 1996 through the National Air Pollution Surveillance Network (NAPS). Dioxins and furans were monitored at seven stations, comprised of four urban and three rural sites. Results show elevated levels at urban sites compared to rural sites with mean concentrations ranging from 741 to 2,096 femtograms per cubic metre (TEQ) at urban sites, and from 182 to 442 femtograms per cubic metre (TEQ) at rural sites (1996 to 1999). These concentrations remain below the Ontario Ministry of Environment ambient air quality criteria of 5 picograms per cubic metre (TEQ), 24-hour average.

Joint Priorities

The Dioxin/Furan Workgroup has been coordinating efforts with the HCB/B(a)P Workgroup on issues that concern both chemical workgroups, including wood stoves, treated wood, and tire fires.

Next Steps

Backyard trash burning is expected to emerge as the largest source of dioxins and furans as other sector reductions continue. Accordingly, the Workgroup will focus its efforts on the implementation of the strategy developed by the Burn Barrel Subgroup. Both countries are looking to the burn barrel activities in the Great Lakes Basin, especially in the Lake Superior region, as a potential model for other parts of each country. For other priority sectors, the Workgroup will continue to monitor and update the Workgroup on progress made. Most of these sectors are being addressed through existing national or regional programs.

To fill information gaps identified in pollutant inventories for dioxins and furans, the Workgroup will engage sectors to collect or develop release information. In Ontario, these sectors include pulp and paper (wood waste combustion boilers, Kraft liquor boilers), foundries, petroleum refineries, secondary aluminum smelting, secondary copper smelting, the steel sector (cokemaking, blast furnaces, steelmaking), and land application of sewage sludge. Both countries have recently added dioxins and furans to their mandatory release reporting programs (Toxics Release Inventory in the U.S. and National Pollutant Release Inventory in Canada). This may provide additional information to help improve the release profiles for dioxins and furans.